

CLAIMS

1 1. A method of leaching low sulphur content ores to release metal
2 values, comprising:

3 preconditioning finely ground elemental sulphur with bacteria,
4 comprising *Thiobacillus thiooxidans*, in a biological reactor so that the
5 hydrophobic sulphur becomes wetted and the bacteria attach themselves to the
6 sulphur surfaces; and

7 agglomerating the preconditioned sulphur particles throughout a
8 leaching heap with the low sulphur content ores to release metal values.

1 2. The method of claim 1 wherein the bacteria further include
2 *Thiobacillus ferrooxidans*.

1 3. The method of claim 1 wherein said finely ground sulphur is
2 produced by rod milling sulphur.

1 4. The method of claim 3 wherein the sulphur is rod milled such
2 that 1.9 kilograms of sulphur in 1 liter of water for 15 minutes produces a
3 product of approximately 50% -400 mesh.

1 5. The method of claim 1 further including adding a bacteria
2 nutrient to the preconditioning process.

1 6. The method of claim 1 further including adding *Thiobacillus*
2 *ferrooxidans* to the agglomerated leaching heap.

1 7. The method of claim 1 wherein the preconditioning process is
2 conducted for 12-48 hours.

1 8. The method of claim 1 further including adding acidic bioleach
2 solution produced during the preconditioning process to the ore during
3 agglomeration to partially satisfy the acid demand of the ore.

1 9. The method of claim 1 further including adding acid bioleach
2 solution produced during preconditioning to the leach solution reservoir to
3 partially satisfy the acidic demand of the ore.

1 10. The method of claim 6 including controlling the pH in the heap
2 in the range of 1.8-2.4 so that the *Thiobacillus ferrooxidans* can rapidly oxidize
3 any metal sulphides present in the ore.